



M157594P.1

ITEM NUMBER: 157594, 157595

SERIAL NUMBER: _____

Installation, Operation, and Maintenance Manual

HOT WATER PRESSURE WASHER: *Cleans dirty surfaces with high pressure hot water.*

To the Owner:

Thank you for purchasing a NorthStar hot water pressure washer. Your machine is designed for long life, dependability, and the top performance you demand! Take time now to read through this manual so you better understand the machines' operation, maintenance and safety precautions. Everyone who operates this machine must read and understand this manual. The time you take now will prolong your machine's life and prepare you for its safe operation. Enjoy the exceptional performance of your NorthStar hot water pressure washer, the industry leader! The manufacturer reserves the right to make improvements in design and/or changes in specifications at any time without incurring any obligation to install them on units previously sold.

Quick Facts

Engine Oil	Engine is shipped with out oil. Fill before starting. Use SAE 10W-30 motor oil.	
Pump Oil	Pump is shipped with oil. Check pump oil level before starting.	
Water	Make sure your water flow is 20% higher than the pressure washer's flow rate. Make sure your water is clean and particle free.	
Storage	Do not allow water to freeze in the pump, hose, coil, or spray gun.	
Spraying Chemicals	Use any NorthStar brand or equivalent pressure washer chemicals. Adjust soap adjustment knob to regulate cleaning power.	
Maintenance Schedule	Engine:	Oil: change after first 20 hours, then annually or every 100 hours. Spark Plug: clean every 100 hours, replace annually or every 300 hours. Air Filter: clean every 100 hours, replace annually or every 300 hours.
	Pump:	Oil: change after first 40 hours, then every 3 months or 500 hours.

Read and understand all manuals before operating.

Any Questions, Comments, Problems, or Parts Orders
Call NorthStar Product Support 1-800-270-0810

Table of Contents			
Important Safety Instructions	2	Long Term/Winter Storage	12
Specifications	3	Troubleshooting Guide	13
Machine Component Identification	4	Parts Breakdowns	14-16
Installation Instructions	5-6	Electrical Schematic	17
Operation Instructions	7-9	Trailer Assembly Instructions (157595)	18
Safety Features	9	California Emissions Statement	19
Maintenance Instructions	10	Limited Warranty	21

Important Safety Instructions

WARNING -Risk of injection or injury to persons - Do not direct discharge stream at persons. - Do not use a hose if exterior damage is evident.

CAUTION -Risk of explosion. Do not spray flammable liquids. Do not operate in a flammable environment. -Risk of asphyxiation. Exhaust fumes are deadly. For outdoor use only. Avoid inhaling exhaust fumes.

-Risk of fire. Do not add fuel when the product is operating or hot.

-Gun kicks back, hold with both hands.

-To reduce the risk of injury, read and understand operating instructions carefully before use.

WARNING - When using this product basic precautions should always be followed, including the following:

- 1.) Read all the instructions before using the product.
- 2.) To reduce the risk of injury, close supervision is necessary when the product is used near children. Do not allow irresponsible use by children. Always stop the product and bleed pressures before leaving unattended, disconnecting hoses, or servicing the pump.
- 3.) Know how to stop the product and bleed pressures quickly. Be thoroughly familiar with the controls.
- 4.) Stay alert - watch what you are doing.
- 5.) Do not operate the product when fatigued or under the influence of alcohol or drugs. Never smoke while operating or fueling this machine.
- 6.) Keep operating area clear of all persons.
- 7.) Do not overreach or stand on unstable support. Keep good footing and balance at all times. Wear footwear capable of maintaining a good grip on wet surfaces - Do not place the machine on soft or unstable ground.
- 8.) Follow the maintenance instructions specified in all manuals. Do not run machine without sufficient lubrication or sufficient water to cool the pump.
- 9.) Wear safety glasses, gloves, face protection and appropriate clothing when operating the machine.
- 10.) Do not operate this machine with broken or missing parts. - Never alter the manufacturer's original design or deactivate any safety device on the machine.
- 11.) Risk of exposure to dangerous chemicals. Wear protective gloves when handling and cleaning with chemicals. Follow the chemical manufacturer's directions. Understand all safety hazards and first aid for all chemicals being used. Check whether dangerous chemicals have been used and take any precautions that may have been recommended by the supplier of these chemicals when cleaning filters. Do not pump highly abrasive fluids or use with incompatible chemicals or solvents.
- 12.) Know the pressure and temperature limits of your machine. Be sure all high pressure accessories meet or exceed your machine's limits. Do not set the pressure relief valve above the machine's limit.
- 13.) Do not move this machine by pulling on the hose. Do not use the pump to support other items of equipment that impose unacceptable loads on the pump. Do not attempt to use this machine as a prop.
- 14.) To reduce risk of injury, do not secure the spray gun open. Your spray gun is equipped with a built-in trigger safety latch to guard against accidental trigger release and potentially dangerous high pressure spray. Rotate the safety latch to the locked position when not spraying.
- 15.) Do not clean this machine with its own spray. Cleaning should be done with a damp sponge with the engine OFF.
- 16.) NEVER attempt to immediately run or re-light the burner if it doesn't ignite the first time. Unburned oil or gas may have accumulated causing potential explosion or fire hazard.
- 17.) Always make sure all switches and controls are in the OFF position prior to starting the engine.

SAVE THESE INSTRUCTIONS

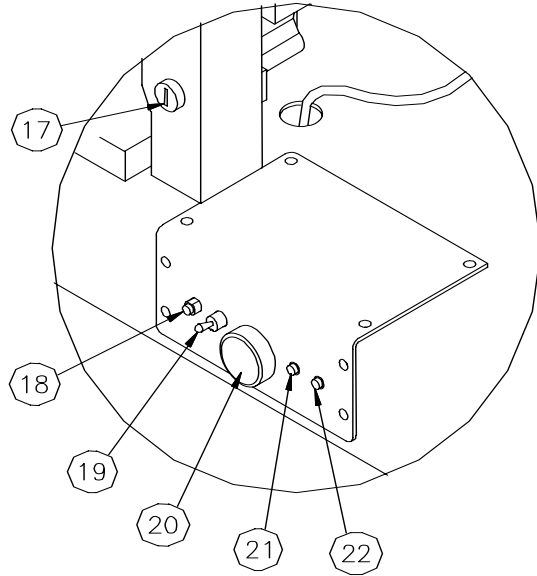
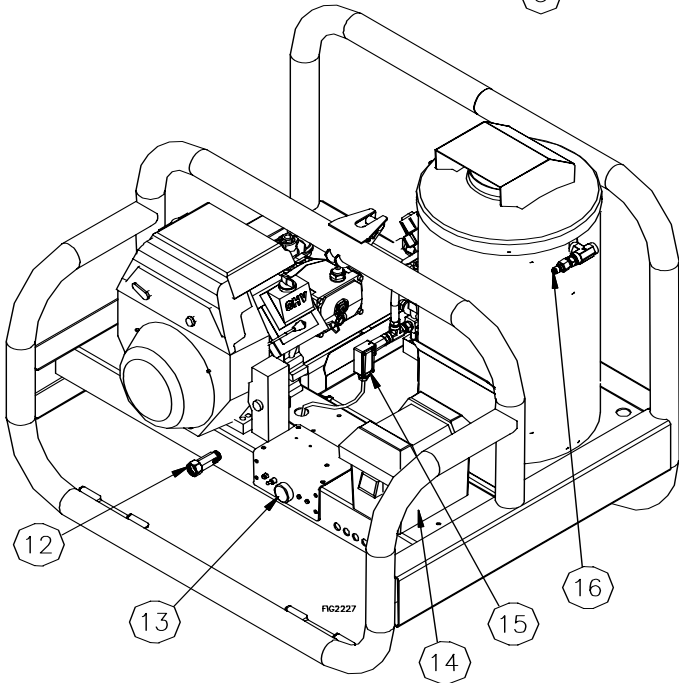
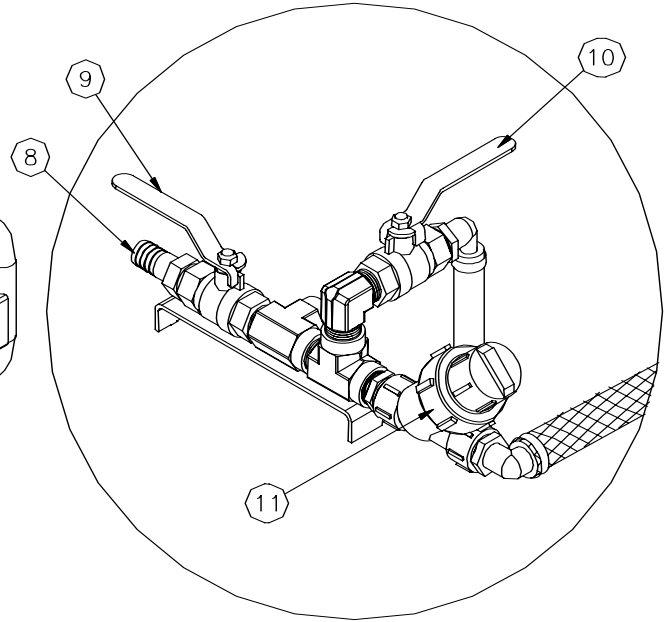
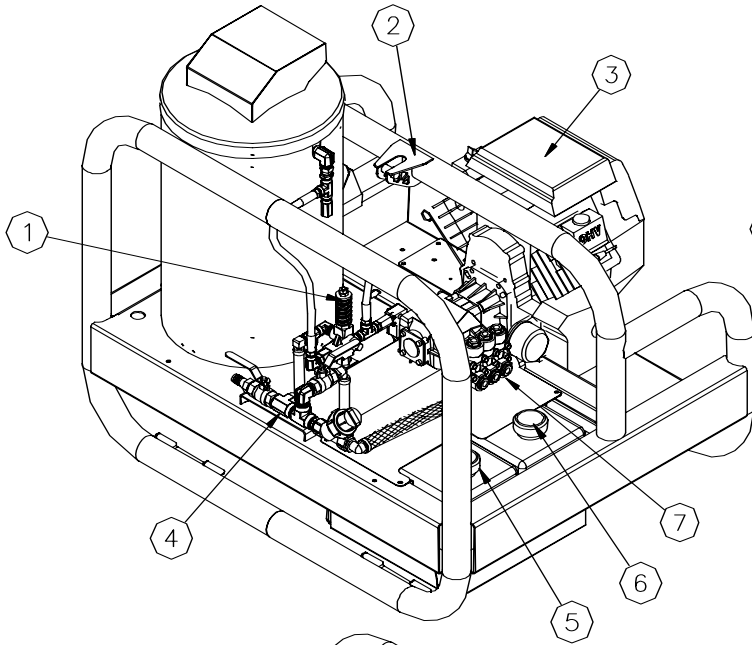
Specifications

Pressure Rating	4000 psi
Flow Output	4 gpm
Pump Type	Cat 66DX
Water Supply	Standard tap water @ 20-75 psi or water feed tank
Engine Horsepower	18 hp
BTU Output	353,700 BTU
Maximum Temperature	210° F
Approved Fuels	#1 or #2 Diesel, Kerosene, Fuel Oil
Fuel Capacity	4 Gal
Gasoline Capacity	4 Gal
Discharge Hose	3/8"
Dimensions (skid only)	47" L X 37.5" W X 42" H
Weight (skid only)	500 lbs

Specifications for Trailer Mounted Models

Trailer GVWR	3500 lbs
Hitch Ball Size	2"
Skid Dimensions	129" L X 75.75" W X 60" H
Weight (tank empty)	960 lb
Weight (tank full)	2500 lb

Machine Component Identification



Ref #	Description	Ref #	Description	Ref #	Description
1	Unloader	9	Ball Valve (feed tank)	16	Water Outlet
2	Lifting Eye	10	Ball Valve (city tap water)	17	Engine Key Switch
3	Engine (see engine manual)	11	Water Filter	18	Circuit Breaker
4	Inlet Plumbing	12	Water Inlet (city tap water) (trailer models use hose reel)	19	Heat Switch
5	Diesel Tank	13	Control Panel	20	Thermostat
6	Gasoline Tank	14	Battery Box	21	Indicator Light (pressure sw)
7	Pump	15	Pressure Switch	22	Indicator Light (thermostat)
8	Water Inlet (feed tank)				

Installation Instructions

Installing a Battery

Warning: Sulfuric acid is a corrosive poison. Avoid contact with skin, eyes or clothing. Always wear safety glasses. Always wear safety glasses when working on or near the battery.

The engine will not run and the burner will not fire without first installing a battery.

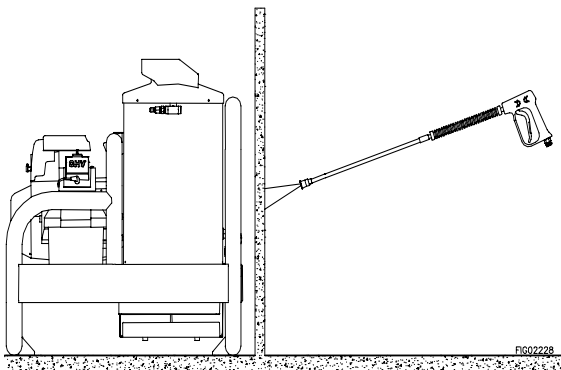
The battery box provides protection for the battery and will accept a standard automotive battery (The inside dimensions are 11-1/8"L x 7-3/4"W x 10-1/8"H). The battery must be 12VDC, with a minimum rating of 18 Ah (Amp-hour). When installing a battery, always connect the red colored ("positive" or "+") cable first. When disconnecting a battery, always remove the black colored ("negative" or "-") cable first

Location

IMPORTANT: Proper initial installation of equipment will assure more satisfactory performance, longer service life, and lower maintenance cost.

IMPORTANT: The use of a back flow preventer (Part #222815 call 1-800-270-0810 to order) on the water supply hose is recommended and may be required by local code.

Place the pressure washer on a solid level surface in a protected area where it is not readily influenced by outside forces such as strong winds, freezing temperatures, rain, etc. Locate the pressure washer for easy access for filling fluids, adjustments, controls, and maintenance. Position the machine so that ambient lighting is sufficient for the surface you are cleaning to be seen with ease. Use artificial light if needed.



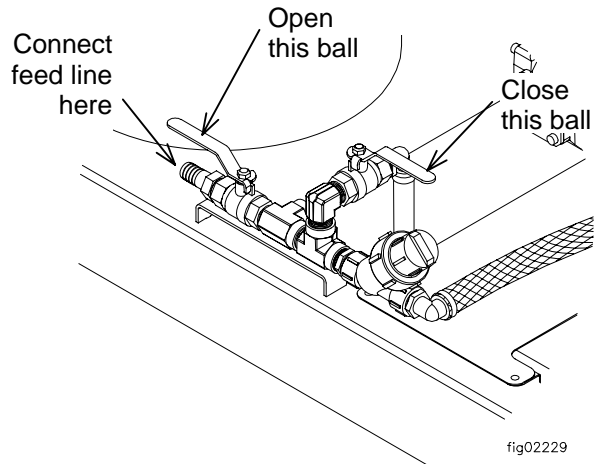
Make a partition between the wash area and the pressure washer to prevent direct nozzle spray from coming in contact with the pressure washer. Moisture reaching the equipment will reduce the pressure washer's service life.

Attaching a Water Feed Tank (157594 only)

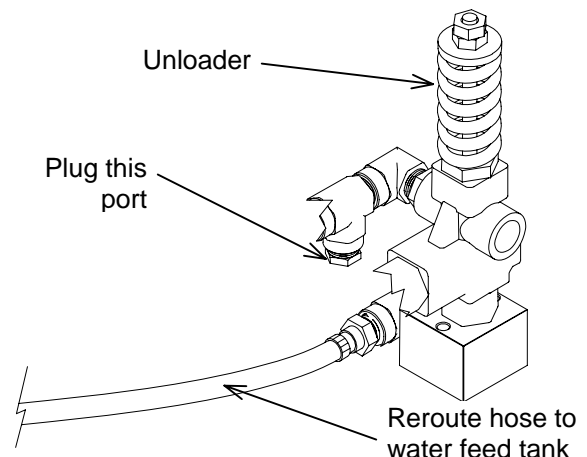
Caution: Make sure to follow these instructions.

Inadequate plumbing between a feed tank and the pressure washer can cause damage to the pump from cavitation.

Cavitation will not occur if you select large fittings and hose to connect the feed tank to the pressure washer. Also, place the pressure washer right next to the feed tank so the connection hose will be as short as possible.



- 1.) Use 3/4" connection hose no longer than 6ft long.
- 2.) Make sure the connection hose does not kink.
- 3.) Make sure all fittings are 3/4" or larger.
- 4.) Do not use 90° elbow fittings unless absolutely necessary.
- 5.) Make sure bottom of the tank is level or higher than the bottom of the skid frame.
- 6.) Do not pump flammable liquids or liquids containing incompatible chemicals or solvents.
- 7.) Reroute the easy start valve so it discharges back to the feed tank. This will aid pump priming on initial start up. The easy start valve is located below the unloader. See Machine Component Identification for location of unloader.



Installation Instructions

Venting

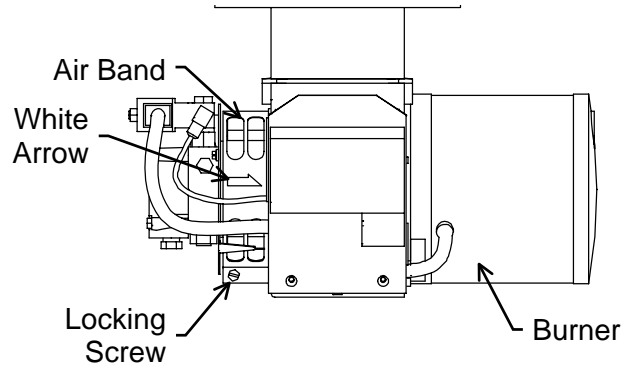
DANGER: Do not run machine indoors or in an enclosed area without adequate ventilation, or in areas where flammable vapors, (gasoline, solvents, etc.) may be present. Do not vent exhaust gases into a wall, a ceiling, or a concealed place.

CAUTION: All venting must be in accordance with applicable state and federal laws, and local ordinances. Consult local heating contractors.

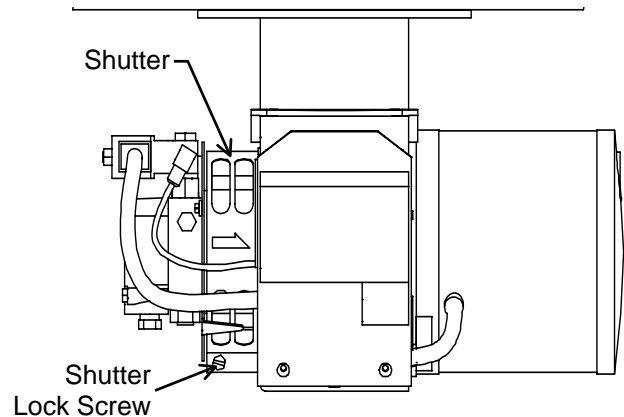
If the pressure washer is to be used in an enclosed area, a flue must be installed to vent burner exhaust to the outside atmosphere. Be sure the flue is the same size as the burner exhaust vent on the pressure washer lid. Poor draft will cause the pressure washer to soot and not operate properly. When selecting the location for installation, beware of poorly ventilated locations or areas where exhaust fans may cause an insufficient supply of oxygen. Proper combustion can only be obtained when there is a sufficient supply of oxygen available for the amount of fuel being burned. If it is necessary to install a unit in a poorly ventilated area, outside fresh air may have to be piped to the burner and a fan installed to bring sufficient air into the unit. Locate the pressure washer in such a manner that the flue will be as straight as possible and protrude through the roof at a proper height and location to provide adequate draft. This oil fired unit must have a draft controller installed in the flue. A draft controller will permit proper upward air flow of exhaust flue gases.

Oil Burner

Burner Air Adjustment: The oil burner is preset and performance tested at the factory (elevation 1100 feet). Different altitudes may require a one-time initial burner correction.



- 1.) Turn the engine and heat switches ON (Refer to "Operation" for details). Have someone operate the spray gun so the burner fires.
- 2.) Loosen the locking screw and close the air band until black smoke appears from the burner exhaust vent. Note the position of the white arrow on the air band.
- 3.) Slowly open the air band until white smoke just starts to appear.
- 4.) Turn the air band half way back to the black smoke position previously noted. Tighten the locking screw.
- 5.) Fine tune the burner air by loosening the shutter lock screw and turning the shutter until the exhaust is cleanest. Tighten the shutter lock screw.



CAUTION: If white smoke appears from the burner exhaust vent during start-up or operation, discontinue use and readjust air bands.

NOTE: If a flue is installed, have a professional serviceman adjust your burner for a #1 or #2 smoke spot on the Bacharach scale.

Operating Instructions

Read and understand the entire manual before operating the pressure washer.
Follow these instructions every time you use the pressure washer.

I.) Pre-Operation

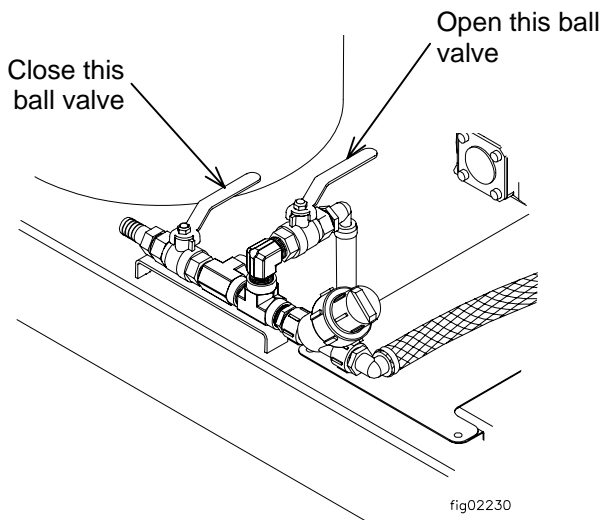
Read entire manual, especially the important safety instructions.

- 1.) Check hoses, fittings, wand, trigger gun and fuel connections for signs of wear, cracks and looseness, and replace as required.
- 2.) Check and clean the nozzle orifice.
- 3.) Check and clean the water inlet screen and filter. (see Maintenance section).
- 4.) Check and maintain proper oil levels in the pump and engine (see Maintenance section).

II.) Connecting City Water Tap

Follow these instructions when supplying water from a pressurized source such as a garden hose instead of a water feed tank.

Attach a garden hose to the water inlet (city tap water). See Machine Component Identification for location of the water inlet (city tap water).

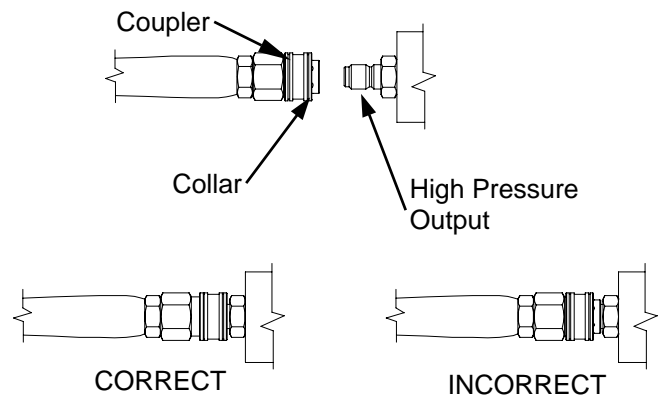


- 1.) Make sure the water supply is clean. Debris can cause excess pump wear and reduce performance.
- 2.) An insufficient water supply will damage your pump. Make sure the water supply is steady and is 20% over the rated flow of your pump. Use a stopwatch to time how long it takes to fill a 5-gallon bucket with your garden hose. It should take less than 62 seconds.
- 3.) The water supply garden hose must have an inside diameter of at least 5/8". If the hose is more than 100 ft. long, the diameter must be at least 3/4".
- 4.) Always use a flexible rubber hose for your water supply. Do not use rigid piping.

III.) Attach High Pressure Hose

Attach the high-pressure hose to the water outlet. See Machine Component Identification section for location of the water outlet

Your pressure washer hose is equipped with quick couplers. Simply pull the collar back and push the coupler onto the nipple. Make sure the collar slides over the ball bearings. Once the connection is made, pull on the hose to assure a positive connection.



Operating Instructions

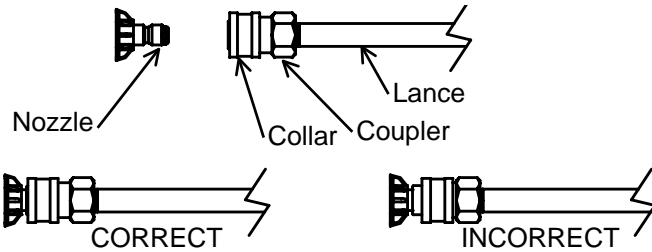
V.) Turn Water Supply ON (city water tap only)

Make sure the hose is not “kinked”. A kinked hose will provide insufficient water supply to the pump and will reduce its life. Make sure the hose remains unkinked after moving the pressure washer.

VI.) Attach Nozzle

Color of Nozzle:	Spray Angle	Used For:
Red	0	Highest Impact
Yellow	15	Tough Stains/ Stripping
Green	25	General
White	40	Light Cleaning
Black	65	Chemicals

Your pressure washer is equipped with four high pressure nozzles. To install a nozzle pull the collar back and push the nozzle into the coupler. Once the connection is made, pull on the nozzle to assure a tight connection.



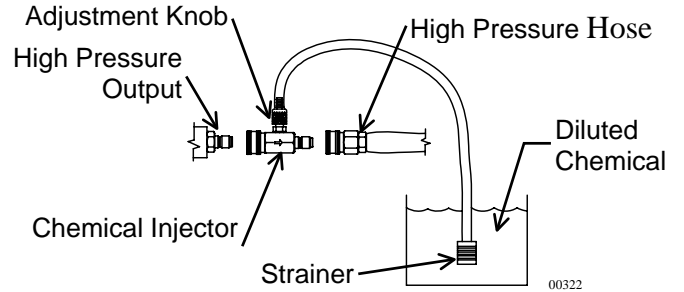
WARNING: Make sure the nozzle is correctly inserted. The nozzle may become a projectile if not inserted correctly. Do not attempt to use different types of nozzles that may not fit the coupler.

VIII.) Applying Chemicals

WARNING: Only use NorthStar pressure washer chemicals or chemicals specifically formulated for pressure washers. Follow the chemical manufacturer’s recommendations. Understand all safety precautions and first aid for all chemicals.

NOTE: Your pressure washer is equipped with a low pressure chemical injector. The proper chemical used for the proper application can speed up cleaning jobs tremendously.

A.) Snap the quick couple chemical injector onto the high pressure outlet and high pressure hose and submerge the suction strainer into the chemical solution.



B.) You need to use the low pressure black nozzle to spray chemicals onto the cleaning surface.

C.) The amount of chemical applied can be changed by turning the chemical adjustment knob located on the chemical injector.

D.) Squeeze the spray gun trigger. The chemical injector will draw the chemical into the water stream

E.) Apply chemicals evenly to the cleaning surface. Allow the chemicals to react with the dirt, then clean at high pressure with green nozzle.

F.) Never use more chemical than is necessary to clean the surface.

G.) If you do not intend on using chemicals, we suggest removing the chemical injector to obtain maximum cleaning pressure.

IX.) Start Engine

See the engine manual to start your engine.

IMPORTANT: The water must be turned on (or water feed tank filled) before starting. Running the pump dry will cause damage and void the warranty.

Make sure only one ball valve is open. The ball valve that you are not using needs to be closed before starting the engine. Pump cavitation can occur.

WARNING: Do not inhale the exhaust from the engine. Do not point the lance at anyone even if the engine has stopped because there could be a release of water under retained pressure if the spray gun trigger is actuated.

Operating Instructions

X.) For Hot Water

If HOT water is desired, make sure there is fuel in the fuel tank, turn the heat switch ON, and adjust the thermostat to the desired temperature. The burner will fire when the trigger is squeezed. You may need to initially adjust your burner for peak performance. See the "Oil Burner" section under INSTALLATION. When the trigger is released a pressure switch automatically turns the burner off. Also, when the temperature setting is reached, the thermostat automatically turns the burner off.

IMPORTANT: Do not run the machine in hot mode without any fuel in the fuel tank. *The fuel pump will be damaged if it is run dry.*

Warning: It is important that the burner stops firing when the trigger is released. If the burner remains firing, discontinue use until the pressure washer is serviced. Extremely high temperatures can result in serious injury and equipment damage.

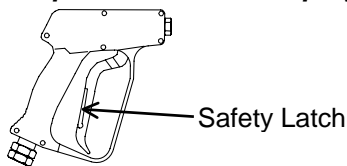
XI.) Cleaning

WARNING: *Wear eye, ear, hand, foot and skin protection at all times while operating this pressure washer.*

DANGER: *Do not point the spray wand at yourself or at any person. Bodily injury may result from water under high pressure.*

CAUTION: *Be careful on painted or delicate surfaces. The pressure may damage the surface if the nozzle is too close.*

IMPORTANT: *Your spray gun is equipped with a built-in trigger safety latch to guard against accidental trigger actuation and potentially dangerous high pressure spray. Rotate the safety latch to the locked position when not spraying.*



- A.) Hold the lance with two hands, have a sturdy stance.
- B.) The pressure washer is set and locked to the maximum rated pressure when it leaves the factory. .

WARNING: *Do not alter the unloader valve's maximum pressure. Excess pressures could cause serious injury and/or pump damage. Any alteration other than turning the adjustment knob will void your warranty.*

XII.) Shut-Down Instructions

WARNING: *Do not leave an operating machine unattended. Always shut the machine OFF and relieve the pressure before leaving the machine. Never disconnect the high-pressure hose from the pump or spray gun while the system is pressurized. Relieve pressure by squeezing the spray gun trigger after the engine is turned OFF.*

- A. Turn heat switch OFF and run cold water through the coil for 3 minutes.
- B. Turn engine OFF.
- C. Turn water supply OFF.
- D. Actuate spray gun trigger to relieve system pressure.
- E. Remove garden hose.
- F. Remove pressure hose.

Safety Features

Safety Relief Valve

The safety relief valve is a backup safety feature. If the system over pressurizes, the safety relief valve will open and relieve system pressure.

The safety relief valve is located in the high pressure line between the unloader and the heat exchanger.

WARNING: *If the safety relief valve ever discharges water, turn the engine off and do not use the machine until it is serviced.*

Thermal Relief Valve

The thermal relief valve allows the pump to remain in bypass without risk of overheating the pump. If high temperatures are developed during bypass, the thermal relief valve will open and discharge hot water onto the ground.

The thermal relief valve is located on the unloader bypass port.

Maintenance Instructions

WARNING: Unauthorized machine modification or use of non-approved replacement parts may cause personal injury and/or property damage and will void the manufacturer warranty.

See Engine manual for engine maintenance.

Maintenance Mode

Before performing any maintenance on the pressure washer, it must be placed in maintenance mode.

- A.) Turn off water supply.
- B.) Relieve pressure from system.
- C.) Turn off engine and disconnect the spark plug cable.

Water Filter

Check whether dangerous chemicals have been used, and take precautions when handling filters.

Before each use, remove filter screen and rinse with clear water.

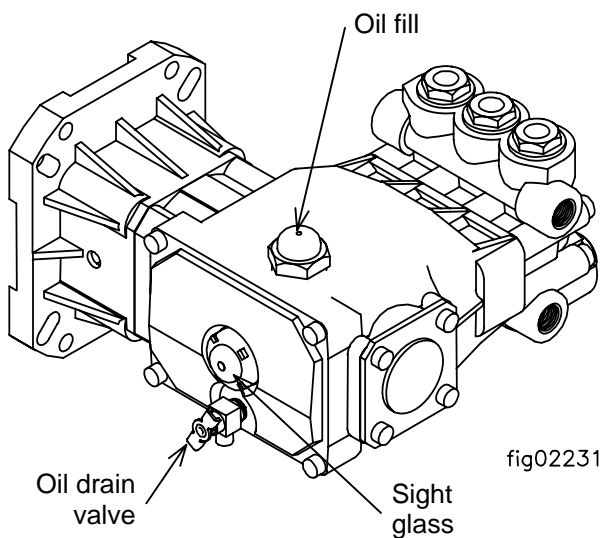
Burner Fuel Filter

Drain water from the fuel filter bowl and replace the filter as needed.

Changing The Pump Oil

*Change oil after first 40 hours, then every 3 months or 500 hours

- 1.) Open oil drain valve.
- 2.) Drain pump oil.
- 3.) Close oil drain valve.
- 4.) Fill pump middle of sight glass with Cat pump oil or 30 wt. non-detergent oil.
- 5.) Oil Capacity is 18oz.



Checking the Hoses

WARNING: Do not use a finger or skin to check for leaks. Escaping fluid under pressure has sufficient force to penetrate the skin, causing serious injury. Do not operate the pressure washer if the hose is cracked, worn, or leaking.

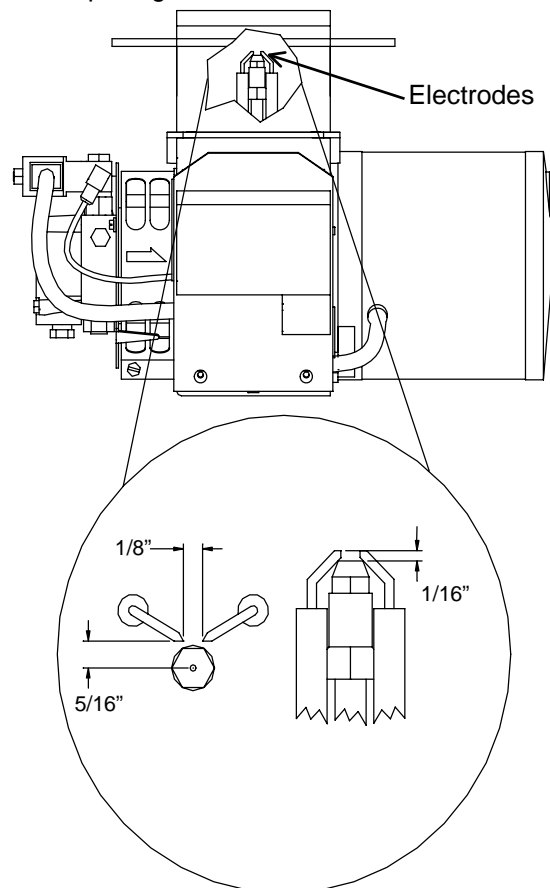
Before each use check all hoses for leaks and worn areas. Discontinue use of any hose if leaks are noticed. Discontinue use of the high pressure hose if the wire mesh is exposed.

Electrodes

Inspect electrodes annually.

Clean off carbon deposits, which may have accumulated on the tips of the electrodes.

Reset the spacing as shown below.



Maintenance Instructions

Coil Descaling

In hard water areas, scale build-up within the heating coil will occur. Scale deposits will decrease the water temperature rise and may eventually clog the heating coil.

1. Mix coil cleaner in a 5 gallon bucket and elevate the bucket so it is higher than the unloader.
2. Attach the high-pressure hose to the high-pressure water outlet on the machine. Do not hook up the spray gun.
3. Place the other end of the high-pressure hose in the 5 gallon bucket.
4. Attach a short length of hose to the garden hose inlet on the pump.
5. Prime the pump by filling the hose with water, then place the end of the hose in the bucket.
6. Run the pressure washer in cold mode for 1 to 3 hours re-circulating the cleaning solution.

Warning: Do not run the burner.

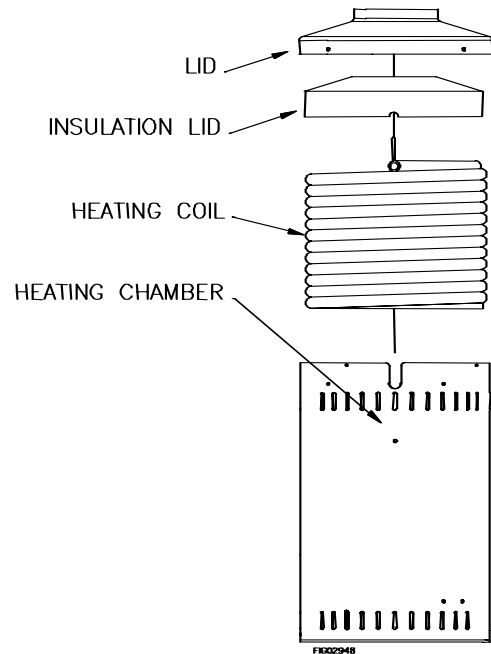
7. Dispose of the cleaning solution where it is not harmful to animals or the environment.
8. Flush with fresh water and clean the inlet strainer when finished.

Coil Desooting

Poor grades of fuel oil or inadequate combustion air will cause heavy soot build-up on the outside surface of the heating coil. These deposits will insulate the coil. This will restrict the airflow through the coil, further aggravating the soot build-up.

Most coils will never require desooting. However, to desoot a coil...

1. Wear protective clothing, goggles, and gloves.
2. Disconnect high-pressure hose on inlet side of coil and thermostat on outlet side of coil.
3. Remove the lid and insulation lid from the heating chamber and hoist the coil out. Be careful, the coil weighs 125 lbs.
4. Clean the coil.
5. Reassemble the coil to the machine. Make sure the white insulation remains in place.
6. Reattach high-pressure hose and thermostat, and make sure all fittings are tight before using the machine.



Long Term / Winter Storage

During cold weather, store the pressure washer indoors and move it outdoors before starting the engine.

Long Term Storage and Freeze Protection

- 1.) Attach a feed tank or bucket to the water inlet (feed tank). See Installation section for Attaching a Water Feed Tank instructions.
- 2.) Fill feed tank with 5 gallons of RV antifreeze.
- 3.) Run the pressure washer in cold mode until RV antifreeze comes out the water outlet. Make sure excess antifreeze is disposed of safely. RV antifreeze will save the components from freeze damage and keep them lubricated.
- 4.) Disconnect spark plug cable. Make sure the engine start switch is OFF.
- 5.) Disconnect the battery and store it indoors.

Short Term Freeze Protection

- 1.) Drain water from feed tank.
- 2.) Drain water from the heat exchanger by extending the high pressure hose straight. Place the end of the hose at a level that is below the pressure washer. Remove the spray gun from the hose. Disconnect the plumbing that connects to the heat exchanger inlet. The water will flow out of the heating coil. This will protect the coil from freeze damage.
- 3.) Open both water inlet ball valves and remove the cap from the water filter. This will drain the pump and water inlet plumbing.

Troubleshooting Guide

Engine Will Not Start	
Causes	Solutions
Low Oil Shutdown	Fill engine with the adequate amount of oil.
Cold Engine	Choke engine to start.
No Fuel	Add gas to engine, make sure fuel shutoff valve is open.
Dead Battery	Recharge/Replace battery.
Spark plug wire not attached	Attach spark plug wire to spark plug.

Pressure Washer Runs But Burner Doesn't Fire	
Causes	Solutions
Heat switch turned OFF	Turn heat switch ON.
Thermostat set too low or off	Set thermostat to desired temp.
Fuel tank empty	Fill fuel tank with kerosene, diesel, or fuel oil.
Defective Pressure Switch	Call Product Support.
Defective Burner	Call Product Support.

Pressure Washer Runs But No Pressure	
Causes	Solutions
Partially clogged or damaged nozzle	Clean or replace nozzle.
Clogged water filter	Clean water filter.
Low water flow	Make sure the water supply is more than 4 gpm.

Pressure Washer Surges Or Cycles While In Bypass	
Causes	Solutions
Leak between unloader and gun.	Check all connections between unloader and gun for leaks. Tighten loose components and replace damaged components.
Gun leaking internally	Replace spray gun.

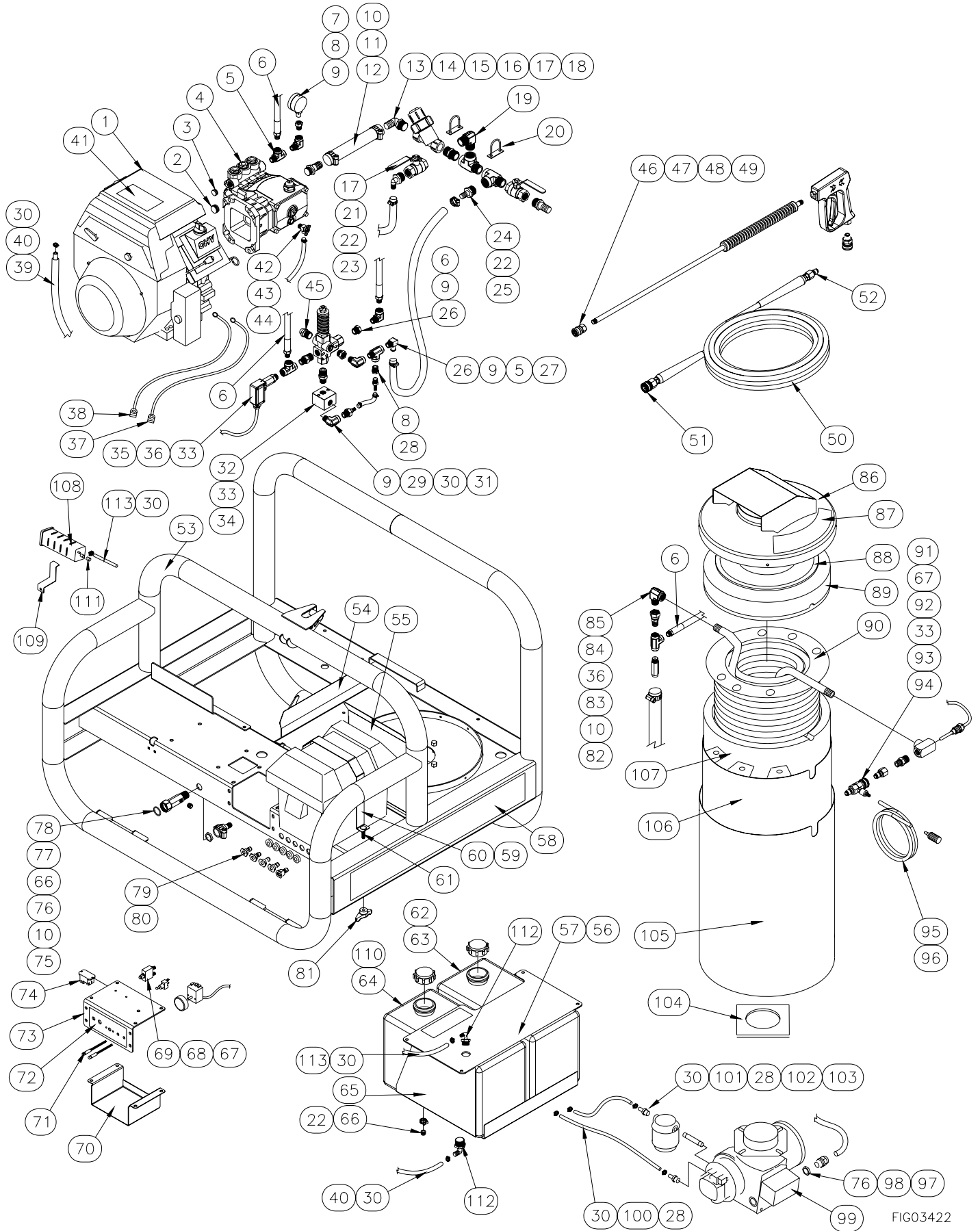
Smoke From Heat Exchanger	
Causes	Solutions
Air band not adjusted properly	Adjust the air band until the burner burns cleanly. See <i>Installation Instructions</i>
Poor quality fuel	Use kerosene for the cleanest burn.

Water Not Heating Sufficiently	
Causes	Solutions
Scale build-up in coil	See <i>Coil Descaling</i> under <i>Maintenance Instructions</i> .
Coil is full of soot	See <i>Coil Desooting</i> under <i>Maintenance Instructions</i> .

Poor Or No Detergent Supply	
Causes	Solutions
Soap control knob set too low.	Adjust soap control knob.
Inadequate detergent supply	Refill detergent container. Make sure chemical strainer is fully submerged.
High pressure hose too long	Use less hose. Move machine closer to the work.
Chemical strainer or injector clogged	Clean the strainer and injector. Always start with a clean detergent container. Run clean water through the injector after each use.

Any Questions, Comments, Problems, or Parts Orders
Call NorthStar Product Support 1-800-270-0810

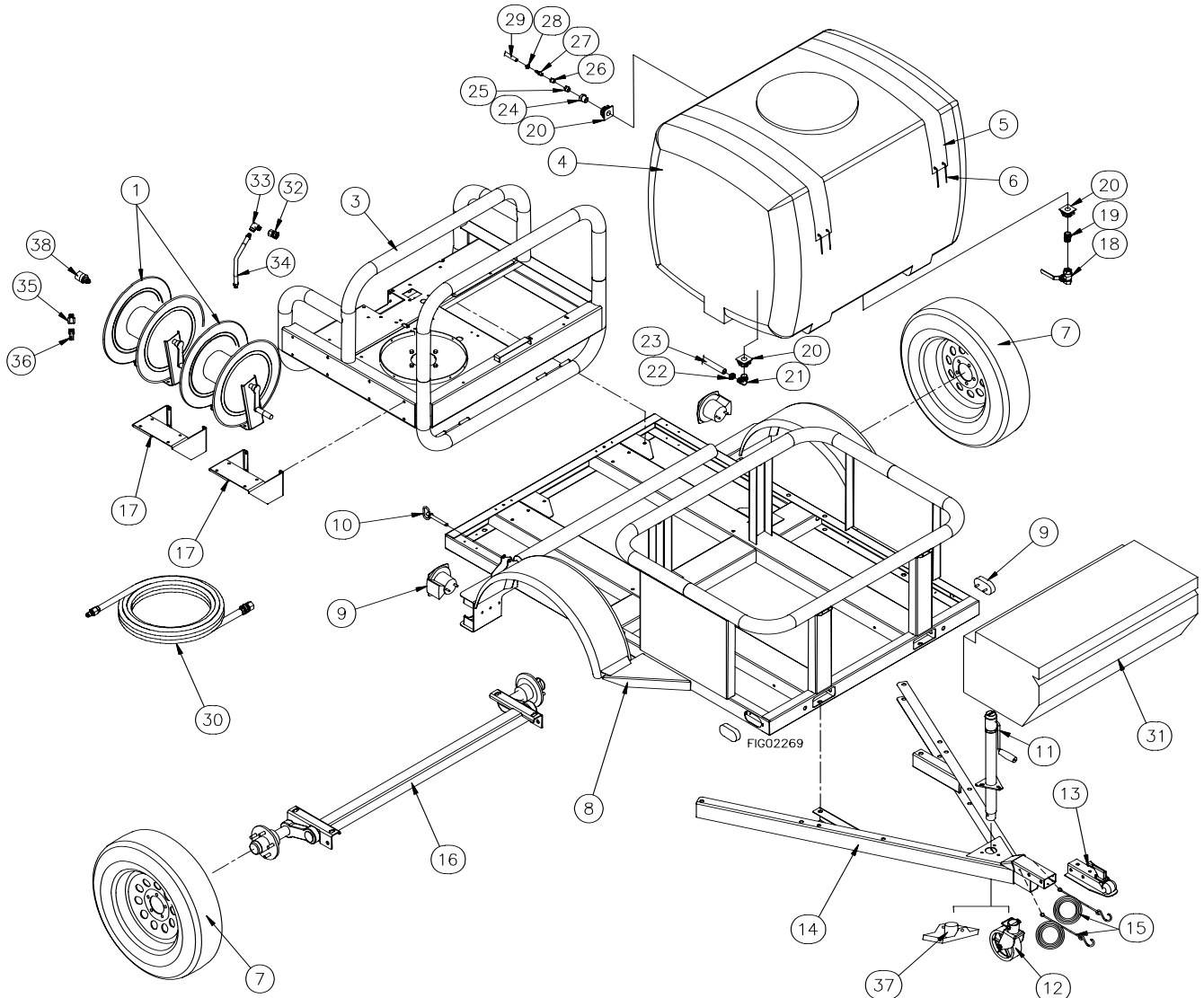
Parts Breakdown 157594P.1



Component List – 157594P.1

REF	PART #	DESCRIPTION	Model	QTY	REF	PART #	DESCRIPTION	Model	QTY
1	783394	Honda engine 18hp	All	1	58	777721	Decal, side panel	All	2
	783396	Honda muffler kit	All	1	59	777647	Battery box	All	1
2	30511	1/2" npt plug	All	1	60	777489	Battery strap	All	1
3	777837	3/8" npt plug	All	1	61	82233	Carriage bolt, 5/16" threads	All	2
4	38198	CAT pump, 4gpm	All	1	62	KEL201071	Cap, fuel tank	All	1
5	777347	3/8" npt tee	All	2	63	777727	Tank, Diesel	All	1
6	777378	Hose, 18" 5400psi	All	2	64	783029	Gasoline tank	All	1
7	777682	Pressure gauge, 6000psi, 1/4" npt	All	1	65	783034	Tank support	All	1
8	777338	Reducer 3/8" npt x 1/4" npt MxF	All	3	66	777838	1/4" NPT plug	157594	2
9	777410	Elbow 3/8" npt MxF	All	3	67	781999	Thermostat	All	1
10	17141	Hose clamp 3/4 hose	All	4	68	777855	Toggle switch	All	1
11	30289	Clear PVC hose, 3/4"	All	12.5in	69	31085	Circuit breaker, 20A	All	1
12	777671	Hose barb 1/2" npt M x 3/4" hose	All	1	70	777644	Control box cover	All	1
13	778829	Hose barb elbow 3/4npt M x 3/4hose	All	1	71	777646	Red LED, 12VDC	All	2
14	250142	Strainer, 3/4" npt FxF	All	1	72	777660	Decal, control panel	All	1
15	780413	Nipple 3/4" npt x 3/4" npt MxM	All	1	73	777643	Control box panel	All	1
16	39206	Tee 3/4" npt MxFxF	All	2	74	36138	Relay 12VDC	All	1
17	35442	Ball valve 3/4" npt FxF	All	2	75	777645	Hose barb 1/2" npt F x 1/2" hose	157594	1
18	5023	Hose barb 3/4" npt x 3/4" hose	All	1	76	305267	Nut, 1/2" npt	157594	2
19	35443	Elbow 3/4" npt x 3/4" npt MxM	All	1	77	30483	Garden hose inlet, 1/2" npt M	157594	1
20	82220	U-bolt	All	2	78	5232	Washer, garden hose	157594	1
21	779269	Elbow 3/4" npt M x 1/2" HB	157594	1		778946	Nozzle 0 degree #4, red	All	1
	780432	Elbow 3/4" npt M x 3/4" HB	157595	1		25309	Nozzle 15 degree #4, yellow	All	1
22	777119	Hose clamp 1/2" hose	157594	5	79	778948	Nozzle 25 degree #4, green	All	1
	17141	Hose clamp 3/4" hose	157595	2		778947	Nozzle 45 degree #4, white	All	1
23	2264	Low pressure hose, 1/2"	157594	27in		778949	Nozzle, chemical, black	All	1
	30289	Clear PVC hose, 3/4"	157595	67in	80	777111	Grommet, nozzles	All	5
24	779268	Hose barb 3/4" npt M X 1/2" hose	All	1	81	38578	Knob, 5/16" thread	All	2
25	2264	Low pressure hose, 1/2"	All	7in	82	30289	Clear PVC hose, 3/4"	All	40in
26	30048	Reducer 1/2" npt x 3/8" npt MxF	All	2	83	22393	Relief valve, 3/8" npt	All	1
27	32808	Elbow 3/8" npt M x 1/2" HB	All	1	84	38379	Swivel, 3/8" npt x 1/2" npt MxF	All	1
28	777340	Hose barb 1/4" npt M x 1/4" hose	All	3	85	5027	Elbow, 1/2" npt MxF	All	1
29	38584	Easy start valve, 3/8" npt M	All	1	86	777652	Lid w/ rain cap	All	1
30	777834	Hose clamp 1/4" hose	All	9	87	305410	Decal, caution hot	All	1
31	777165	Clear PVC hose, 1/4"	All	12"	88	36302	Fiberglass rope, 5/8"	All	39in
32	782123	Unloader	All	1	89	38398	Insulation, cap	All	1
33	777337	Nipple 1/2" npt x 3/8" npt MxM	All	3	90	779228	Heating coil	All	1
34	777409	Unloader block	All	1	91	305278	Heat shrink tube	All	2in
35	777656	Pressure switch	All	1		30501	Split loom	All	24in
36	777411	Tee 3/8" FxFxF	All	2	92	305208	Tee 1/2" npt FxFxF	All	1
37	777667	Battery cable, red	All	1	93	777915	Quick couple nipple, 3/8" npt F	All	1
38	777668	Battery cable, black	All	1	94	779614	Injector, quick couple	All	1
39	31881	Reflective sleeve	All	14in	95	777165	Clear PVC hose, 1/4"	All	48in
40	777345	Fuel line, 1/4"	All	42in	96	221222	Strainer, chemical hose	All	1
41	35743	Warning label	All	1	97	777661	Wire harness, burner	All	1
42	35413	Drain valve	All	1	98	22502	Strain relief	All	1
43	30746	Hose clamp 3/8" hose	All	1	99	777669	Burner DC	All	1
44	30290	Clear PVC hose, 3/8"	All	14in	100	777345	Fuel line, 1/4"	All	22in
45	777836	Thermal protector, 1/2" npt	All	1	101	777345	Fuel line, 1/4"	All	15.5in
46	777904	Quick coupler, 1/4" npt F	All	1	102	32308	Fuel filter, water separator	All	1
47	777421	Spray lance	All	1	103	305239	Nipple 1/4" npt MxM 3" long	All	1
48	777420	Spray gun	All	1	104	38120	Insulation gasket	All	1
49	777422	Quick coupler, 3/8" npt M	All	1	105	36180	Stainless wrap	All	1
50	777396	Hose, 50ft 5400psi, includes 51+52	All	1	106	779232	Fire chamber	All	1
51	777722	Quick coupler, 3/8" npt F	All	1	107	33387	Insulation, can	All	1
52	777723	Quick couple nipple, 3/8" npt F	All	1	108	783036	390cc carbon canister	All	1
53	777475	Skid frame	157594	1	109	783037	Carbon canister strap	All	1
54	777488	Heat shield, tanks	All	1	110	784769	Sealed fuel cap	All	1
55	777486	Heat shield, battery	All	1	111	783218	Purge port cap	All	1
56	783035	Tank clamp	All	1	112	783212	1/4" MPT hose barb elbow	All	2
57	777666	Decal, gasoline	All	1	113	777345	Fuel line, 1/4"	All	37"

Parts Breakdown – 157595P.1



REF	PART #	DESCRIPTION	QTY
1	783427	Hose Reel	2
3	777903	Frame, Skid	1
4	30198	200 Gal Tank	1
5	777707	Tank Strap	2
6	82080	Eye Bolt, 1/4"	4
7	780200	15" Wheel	2
8	777771	Trailer Frame	1
9	127432	Trailer Light Kit (rear, front, wires)	1
10	38485	Pin	1
11	783097	Jack	1
12	783098	Wheel for Jack	1
13	777775	Coupler	1
14	782938	A-frame Tow bar	1
15	779542	Safety Cables	2
16	39166	Axle	1
17	779782	Hose Reel Mount	2
18	35442	Ball Valve	1
19	5318	Nipple 3/4 NPT x 3/4 Hose Barb	1

REF	PART #	DESCRIPTION	QTY
20	5370	Bulkhead 3/4" NPT Female	3
21	50NBR12	1/2 Hose Barb x 3/4 NPT Elbow	1
22	17141	Hose Clamp 3/4	1
23	30289	3/4 Clear PVC Hose	
24	50CSC128	3/4" - 1/2" Reducer	1
25	30048	1/2" - 3/8" Reducer	1
26	777338	3/8" - 1/4" Reducer	1
27	777340	1/4" NPT x 1/4" Hose Barb	1
28	17141	1/4" Hose Clamp	2
29	777165	1/4" Clear PVC Hose	12"
30	777779	150' 3/8" 5400PSI Hose	1
31	779801	Truck Chest	1
32	777914	QC 3/8" Female Coupling	1
33	777410	3/8" Street Elbow	1
34	777378	18" 3/8" 5400 PSI Gray Hose	1
35	779816	3/8 MPT x 1/2 FPT Adapter	1
36	777671	1/2 NPT x 3/4 Hose Barb	1
37	783099	Jack Plate	1
38	783426	3/8" Swivel Fitting	2

Wiring Diagram – Rev P.1

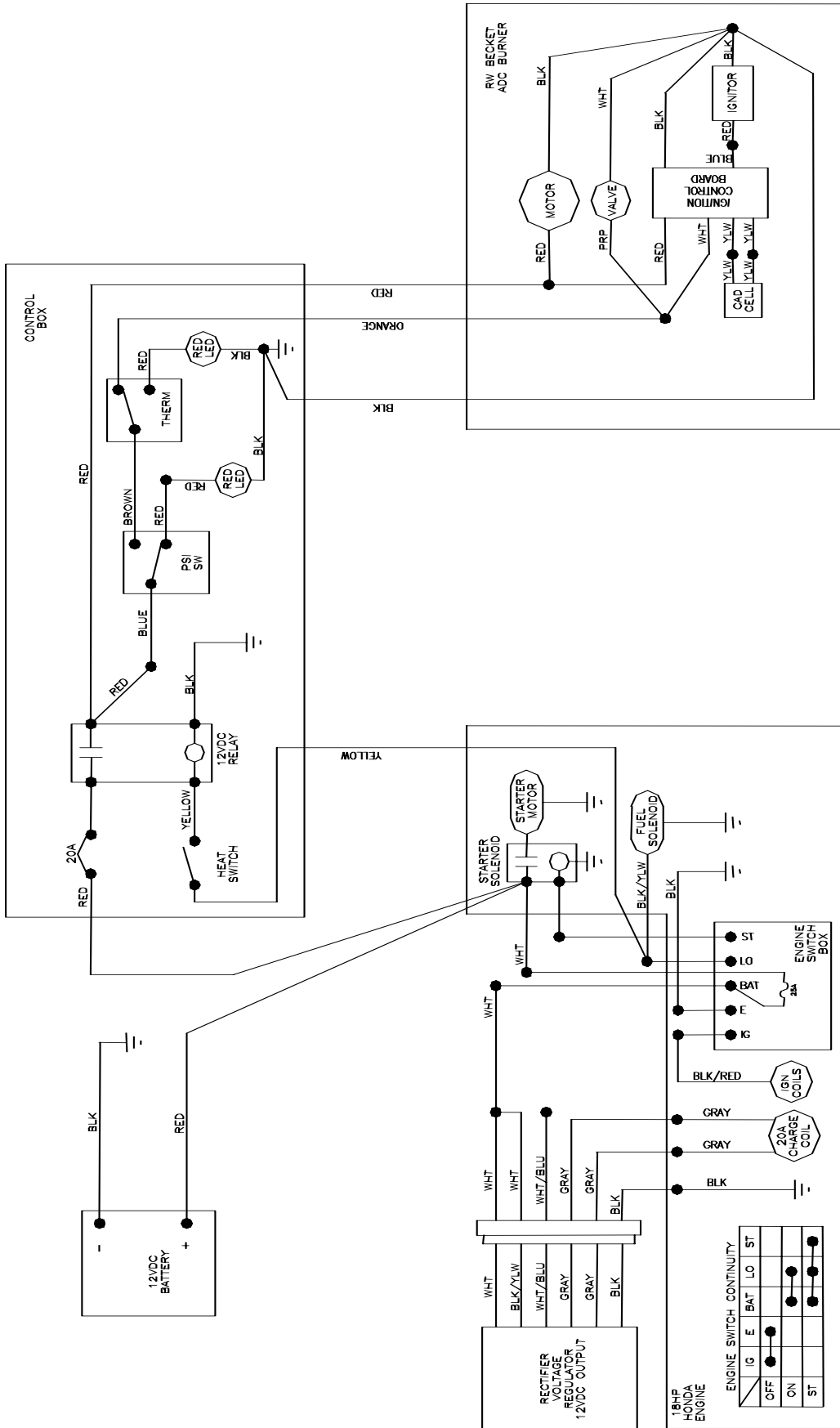
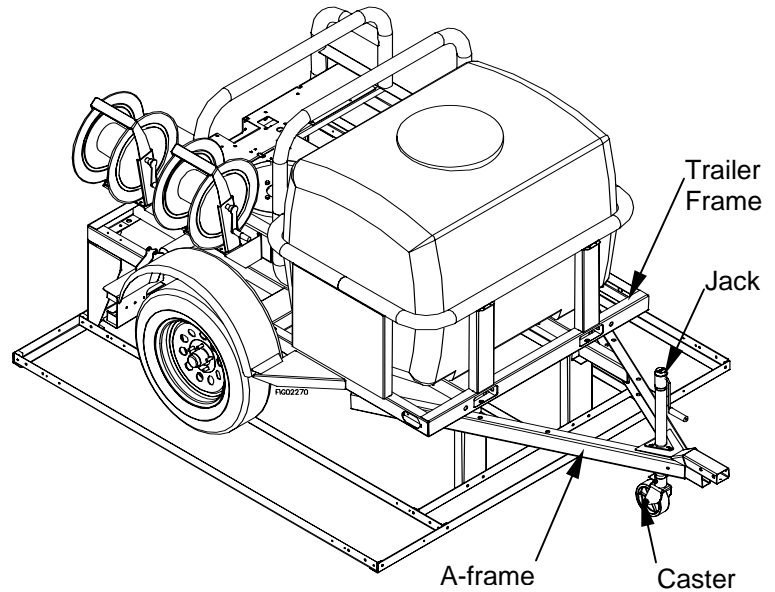


FIG02233

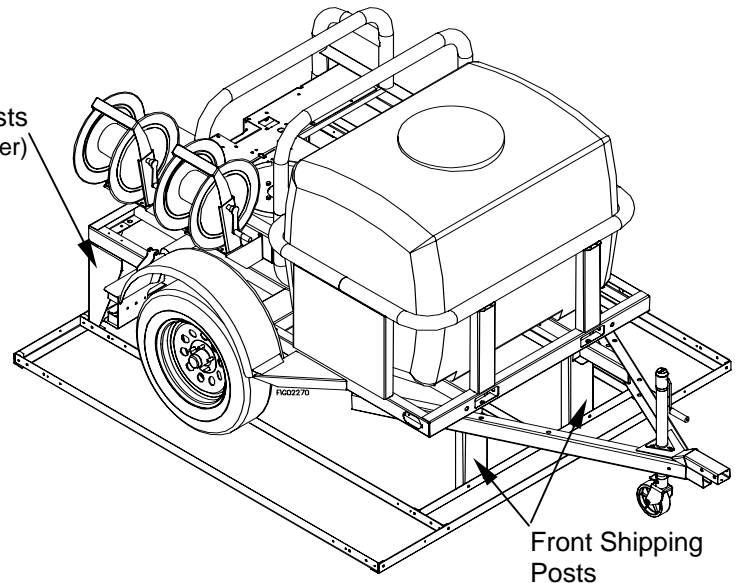
Trailer Assembly Instructions (157595 only)

- 1.) Remove the top and four sides of the steel crate.
- 2.) Remove a-frame from trailer frame. (keep fasteners for step 7)
- 3.) Slide a-frame into holders under trailer frame (built into the front posts).
- 4.) Install jack onto a-frame with 3/8x1" bolts, Class G lock nuts, and washers provided. Tighten to 37ft/lbs.
- 5.) Slide caster wheel onto jack and secure with pin.
- 6.) Crank jack down until a-frame becomes level.
- 7.) Attach a-frame to trailer frame with six 5/8" bolts and Class G nuts. Tighten to 180ft/lbs.
- 8.) Check trailer light wire routing through a-frame, make sure wires are not pinched, stretched, or pass any rough edges.

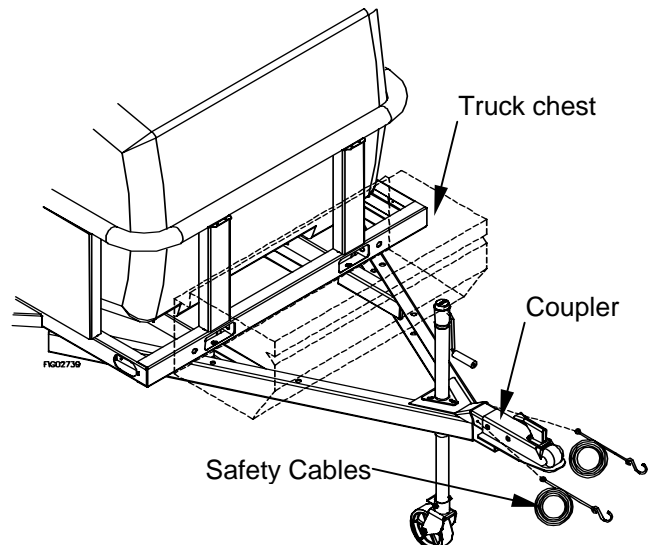


- 9.) Crank jack down farther (so a-frame goes up) to take weight off front shipping posts.
- 10.) Remove front shipping posts.
- 11.) Crank jack up as far as it will go (so a-frame goes down and weight is applied to wheels)
- 12.) Disconnect rear shipping posts from frame (remove only the bolts at the top of the rear shipping posts)
- 13.) Roll trailer forward until it is free of the rear shipping posts.

Rear Shipping Posts
(one on each corner)



- 14.) Attach coupler to a-frame with two 1/2x4" bolts and Class G lock nuts. Tighten each bolt to 90ft/lbs.
- 15.) Attach safety cables to the a-frame with 1/2"x 5" bolt and Class G lock nut. Place a flat washer next to the head of the bolt, slide the bolt through the cable and the a-frame. Then slide the other cable onto the bolt, followed by another washer then the lock nut. Tighten to 37ft/lbs.
- 16.) Attach truck chest to a-frame with four 5/16x1" bolts, lock nuts, and washers. Insert bolts down through holes in truck chest and a-frame. Place washers under wall of a-frame and fasten with lock nuts. Tighten each bolt to 20ft/lbs.



CALIFORNIA EMISSION CONTROL WARRANTY STATEMENT YOUR WARRANTY RIGHTS AND OBLIGATIONS

The California Air Resources Board and Northern Tool and Equipment Co, Inc. are pleased to explain the Evaporative Emission Control System (EECS) warranty on your Small Off Road Equipment (SORE). In California, new SORE must be designed, built and equipped to meet the State's stringent anti-smog standards. Northern Tool and Equipment Co, Inc. must warrant the EECS on your SORE for the period of time listed below provided there has been no abuse, neglect or improper maintenance of your SORE.

Your EECS may include parts such as the carburetor, fuel-injection system, the ignition system, catalytic converter, fuel tanks, fuel lines, fuel caps, valves, canisters, filters, vapor hoses, clamps, connectors, and other associated emission-related components.

Where a warrantable condition exists, Northern Tool and Equipment Co, Inc. will repair your SORE at no cost to you including diagnosis, parts and labor.

MANUFACTURER'S WARRANTY COVERAGE:

This evaporative emission control system is warranted for two years. If any evaporative emission-related part on your equipment is defective, the part will be repaired or replaced by Northern Tool and Equipment Co, Inc.

OWNER'S WARRANTY RESPONSIBILITIES:

As the SORE owner, you are responsible for performance of the required maintenance listed in your owner's manual. Northern Tool and Equipment Co, Inc. recommends that you retain all receipts covering maintenance on your SORE, but Northern Tool and Equipment Co, Inc. cannot deny warranty solely for the lack of receipts or your failure to ensure the performance of all scheduled maintenance.

As the SORE owner, you should however be aware that Northern Tool and Equipment Co, Inc. may deny you warranty coverage if your SORE or a part has failed due to abuse, neglect, or improper maintenance or unapproved modifications.

You are responsible for presenting your SORE to Northern Tool and Equipment Co, Inc.'s distribution center or service center as soon as the problem exists. The warranty repairs should be completed in a reasonable amount of time, not to exceed 30 days. If you have a question regarding your warranty coverage, you should contact Northern Tool and Equipment Co, Inc. at 1-800-270-0810.

GENERAL EMISSIONS WARRANTY COVERAGE:

Northern Tool and Equipment Co, Inc. warrants to the ultimate purchaser and each subsequent purchaser that the SORE is:

Designed, built and equipped so as to conform with all applicable regulations; and

Free from defects in materials and workmanship that cause the failure of a warranted part to be identical in all material respects to that part as described in Northern Tool and Equipment Co, Inc.'s application for certification.

The warranty period begins on the date the SORE is delivered to an ultimate purchaser or first placed into service. The warranty period is two years.

Subject to certain conditions and exclusions as stated below, the warranty on emission-related parts is as follows:

(1) Any warranted part that is not scheduled for replacement as required maintenance in the written instructions supplied, is warranted for the warranty period stated above. If the part fails during the period of warranty coverage, the part will be repaired or replaced by Northern Tool and Equipment Co, Inc. according to subsection (4) below. Any such part repaired or replaced under warranty will be warranted for the remainder of the period.

(2) Any warranted part that is scheduled only for regular inspection in the written instructions supplied is warranted for the warranty period stated above. Any such part repaired or replaced under warranty will be warranted for the remaining warranty period.

(3) Any warranted part that is scheduled for replacement as required maintenance in the written instructions supplied is warranted for the period of time before the first scheduled replacement date for that part. If the part fails before the first scheduled replacement, the part will be repaired or replaced by Northern Tool and Equipment Co, Inc. according to subsection (4) below. Any such part repaired or replaced under warranty will be warranted for the remainder of the period prior to the first scheduled replacement point for the part.

(4) Repair or replacement of any warranted part under the warranty provisions herein must be performed at a warranty station at no charge to the owner.

(5) Notwithstanding the provisions herein, warranty services or repairs will be provided at all of our distribution centers that are franchised to service the subject engines or equipment.

(6) The SORE owner will not be charged for diagnostic labor that is directly associated with diagnosis of a defective, emission-related warranted part, provided that such diagnostic work is performed at a warranty station.

(7) Northern Tool and Equipment Co, Inc. is liable for damages to other engine or equipment components proximately caused by a failure under warranty of any warranted part.

(8) Throughout the SORE warranty period stated above, Northern Tool and Equipment Co, Inc. will maintain a supply of warranted parts sufficient to meet the expected demand for such parts.

(9) Any replacement part may be used in the performance of any warranty maintenance or repairs and must be provided without charge to the owner. Such use will not reduce the warranty obligations of Northern Tool and Equipment Co, Inc.

(10) Add-on or modified parts that are not exempted by the Air Resources Board may not be used. The use of any non-exempted add-on or modified parts by the ultimate purchaser will be grounds for disallowing a warranty claims. Northern Tool and Equipment Co, Inc. will not be liable to warrant failures of warranted parts caused by the use of a non-exempted add-on or modified part.

WARRANTED PARTS:

The repair or replacement of any warranted part otherwise eligible for warranty coverage may be excluded from such warranty coverage if Northern Tool and Equipment Co, Inc. demonstrates that the SORE has been abused, neglected, or improperly maintained, and that such abuse, neglect, or improper maintenance was the direct cause of the need for repair or replacement of the part. That notwithstanding, any adjustment of a component that has a factory installed, and properly operating, adjustment-limiting device is still eligible for warranty coverage. The following emission warranty parts list are covered (use portions of this list applicable to your SORE:

- (1) Fuel Tank
- (2) Fuel Cap
- (3) Fuel Line
- (4) Fuel Line Fittings
- (5) Clamps
- (6) Vapor Hoses
- (7) Carbon Canister
- (8) Canister Mounting Brackets

Dear Valued Customer:

The NorthStar Product you just purchased is built with the finest material and craftsmanship. Use this product properly and enjoy the benefits from its high performance. By purchasing a NorthStar product, you show a desire for quality and durability.

Like all mechanical equipment this unit requires a due amount of care. Treat this unit like the high quality piece of machinery it is. Neglect and improper handling may impair its performance. Please thoroughly read the instructions and understand the operation before using your product.

Limited Warranty

NorthStar shall warranty any piece of equipment manufactured, or parts of equipment manufactured, to be free from defects in material or workmanship for a period of 2 years from the date of purchase by user. This warranty applies to the original purchaser of the equipment and is non transferable. Verification of purchase is the responsibility of the buyer. Parts will be replaced or repaired at no charge, except when the equipment has failed due to lack of proper maintenance. Any misuse, abuse, alteration or improper installation or operations will void warranty. Determining whether a part is to be replaced or repaired is the sole decision of NorthStar.

NOTE: Some services performed by parties other than NorthStar may void warranty.

This warranty covers parts only. It will not provide for replacement of complete products due to defective parts. Components not manufactured by NorthStar such as engines are guaranteed by their manufacturer and can be serviced at factory-authorized locations near you. Any costs incurred due to replacement or repair of items outside of a NorthStar approved facility is the responsibility of the buyer and not covered under warranty. NorthStar can supply you with the service center location in your area.

This warranty specifically excludes the following; failure of parts due to damage caused by accident, fire, flood, windstorm, acts of God, applications not approved by NorthStar in writing, corrosion caused by chemicals, use of replacement parts which do not conform to manufacturer's specifications, and damage caused by vandalism. Additional exclusions: loss of running time, inconvenience, loss of income, or loss of use, including any implied warranty of merchantability of fitness for a specific use.

Warranty does not cover items subject to normal wear such as tires, receptacles or any part subject to direct physical contact by the public. This warranty does not cover any personal injury or damage to surrounding property caused by failure of any part.

This warranty is in lieu of any other warranty expressed or implied and NorthStar assumes no other responsibility or liability outside that expressed within this warranty.

Please fill in the following information and have it on hand when you call in a warranty claim.

Customer Number: _____

Date of Purchase: _____

NorthStar Serial Number: _____

Item Number: _____



Manufactured by
Northern Tool + Equipment Co.,
2800 SouthCross Drive West
P.O. Box 1499 Burnsville, MN 55337-0499